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BOOK REVIEWS.

LA MÉTHODE DANS LES SCIENCES EXPÉRIMENTALES. Par *Louis Favre.* Paris: Schleicher Frères. 1898. Pages, xxv, 470. Price, 5 francs.

L'ORGANISATION DE LA SCIENCE. Cours libre professé a La Sorbonne. Par *Louis Favre.* Paris: Schleicher Frères. 1900. Pages, ix, 409.

From the prospectus and the general spirit and contents of its first two volumes, the present series of works devoted to the critical discussion and systematic exposition of the methods which obtain in the experimental sciences, bids fair to be a sound and serviceable contribution to semi-philosophical literature. Volumes have been announced on methods in agronomy, in sociology, psychology, and economy, in zoölogy, botany, and mineralogy, a work on the elements of physics, and another on the philosophy of the sciences. It has been the intention of the editor of the series, M. Louis Favre, to contribute to the advancement of the experimental sciences by placing at the disposal of investigators, particularly young investigators, the methods which are absolutely requisite for progress. In any discovered fact there are two features to be observed, the discovered fact itself, which belongs to the past of science, and the *method* which serves for its discovery, which forms part of the future of science. The fact passes away; the fact is the fruit which has but the life of a day. But the method employed to produce the fruit, the method which has caused the seeds of truth to bear the fruit,—this is the permanent product, which abides forever and which claims the highest and noblest attention of the man of science. Now, there are two modes of expounding science, that which is devoted principally to the exposition of the discovered facts, which is naturally the method of elementary instruction, and that which is devoted principally to expounding the methods which have enabled us in the past and will also enable us in the future, to discover facts and relations of facts, and which naturally belongs to advanced instruction. It is this second mode of exposition that is to be employed exclusively in the series of works here announced, which will treat of every experimental science now existing or ever destined to take rank as such, not excluding the industrial and æsthetic arts.

The single facts of nature, according to M. Favre, have not a distinctive and particular essence of their own; each, on the contrary, has its necessary and characteristic relations and resemblances with other facts. Facts are, if we so wish to phrase it, of different species, but these different species admit of classification into genera, embracing related species, and frequently even into still more extensive groups. Now, to show how in any one given case some stubborn fact has been attacked, to show by what methods the difficulties which it presented have been conquered, is tantamount to showing how it is possible, by slight modifications of the procedure employed in the original case, to conquer similar difficulties belonging to the same genus but differing only with regard to species. It is to be shown, in the case of each method, what is essential, also what is general, what admits of universal application. The mechanism of each method is to be dissected, so that the reader may clearly see for what purpose each of the principal parts is designed; and, after seeing for what purpose it has been employed, to be able to determine for what purpose it may be employed in the future. In science, in the combat against ignorance and error, a method is not a tool which wears out or loses its edge by usage; on the contrary, it grows constantly more fit for its purpose, and increases in keenness the more it is employed, always acquiring new strength from every new usage.

In the first volume of the series, entitled *Method in the Experimental Sciences*, M. Favre has considered the nature of hypotheses, explanation by analogy, explanation by comparison, cause and effect, experiments, instruments, etc. He has some good remarks to make on classical errors, on the impossible problems of science, scientific prejudices, scientific paganism and heredity, on the power of words, etc. It would lead us too far to enter exhaustively into this theory of explanation. It may be indicated briefly only. A proposition, he says, explains a fact when, starting from the data contained in the proposition, the fact can be rigorously deduced from it. Conditions (the presence and mutual action of determinate quantities of energy, matter, and ether) explain a fact when, starting from the conditions as given, the fact can be rigorously deduced. The ideal type of scientific explanation is dynamic explanation, which, having two angular components given, enables us to deduce a resultant. The most general form of the problem of explanation in the experimental sciences is, having given a phenomenon as result, to determine the conditions which produced it. The composition of forces, motions, etc., is the general ideal type. The form in which every scientific explanation (hypothesis or explanatory theory) should be announced is the following: 'Things (as actually known and studied) take place *as if* such and such conditions were the cause of the phenomena observed." Thus, "things take place in nature *as if* there were *energy*, *substance* (matter and ether), and *laws* for regulating the relations between energy and substance." "Things take place *as if* 'centrifugal force' really existed." "Things take place *as if* 'imaginary quantities' existed." "Things take place," to revert to some antiquated views, "*as if* nature had a horror of a vacuum, *as if* caloric existed," etc., etc. While one may have criticisms to make of the shadowy and dualistic form which the theory of explanation may sometimes assume on this doctrine, one must certainly say that the remarks of M. Favre are in many instances elucidative and that they agree in the main with the current views of the philosophy of science.

In his second volume, M. Favre outlines for the various experimental sciences (applied mechanics, physics, chemistry, biology, etc.) the plan of organisation which he deems desirable, by distinguishing in the case of each science, first the organisation of its component parts, and secondly the organisation of labor of its workers. He lays much stress upon the importance of adopting for each science commonly accepted definitions, common classifications, nomenclatures, etc., and for physics he has especially given what he deems to be a convenient and logical plan for the study of that science. μ.

A STUDENT'S HISTORY OF PHILOSOPHY. By *Arthur Kenyon Rogers, Ph. D.*, Professor of Philosophy in Butler College. New York: The Macmillan Company. 1901. Pages, xi, 519. Price, $2.00.

Of the making of histories of philosophy there seems to be no end, but the present attempt of Dr. Rogers, from its readableness and simplicity, is deserving of a cordial reception. His method has been selective, and it has been his aim to attain economy and clearness of presentation as distinguished from detailed comprehensiveness, at least so far as that has been possible, "without losing sight of the real meaning of philosophical problems." In summing up the thoughts of individual philosophers, he has neglected the minor points of their teachings, and primarily endeavored to emphasise the "spirit" in which they philosophise and the main problems in connexion with which they have made their impression on the development of human thought. Minor names have been passed over. The Mediæval period, while admitted to be intrinsically of great importance, is awarded only 60 pages out of the 500 and more that constitute the volume. A book with this selective purpose Dr. Rogers believes has its place alongside such a volume as Weber's, although he seems to forget that the actual reading space which his work occupies is nearly, if not exactly, as great as that of Weber's. The bulk of the volume has been increased slightly by verbatim quotations from the great philosophical writers, particularly in places where the literary interest supplements the philosophical. This has been especially the case with the Greek philosophers, and has undoubtedly helped to swell the volume. This has its good side, however, and the author hopes by it to arouse "an interest in the masterpieces of philosophy at first hand," a hope which we sincerely trust will be fulfilled. Greek philosophy to Philo occupies 181 pages. The Religious Period, so called, occupies 27 pages; modern philosophy, 250 pages; philosophy since Hegel receives brief, one might even say composite, treatment, but is none the less distinct and intelligible on that account. Recent philosophy is indicated merely in its general tendencies.

The work is unhampered by unnecessary footnotes and references, though there are good general bibliographies; and while the space devoted to some phi-